

REMARKS/ARGUMENTS

Favorable reconsideration of the application, as presently amended in light of the following discussion, is respectfully requested.

This Amendment is in response to the Final Office Action mailed on August 26, 2003. Claims 17-26 are pending in the application and stand rejected. Applicants have amended herein Claims 17 - 19, 22, and 25.

Applicants thank the Examiner for the courtesy of a personal interview extended to Applicants' representatives on November 13, 2003. During the interview, Applicants reiterated the differences between the claimed invention and Welch previously argued on the Amendment submitted on June 12, 2003 and presented argument related to the additional fact that Welch does not teach or disclose the advantageous shield structure having an inner surface uniform or flush once the shutter is inserted in the notch in the shield. Although an accord was not reached for the differences previously argued on June 12, 2003, an agreement was reached that "the claim limitation of an even curvature of an inner surface of the deposit shield can be qualified by adding flush surface, or similar language, to further distance Welch who does not teach said compliant or flushed surface configuration" (Interview Summary, form PTOL 413).

In order to avoid delays in the prosecution process, Applicants have amended herein the independent claims to recite the subject matter agreed upon during the interview. In view of the amendments submitted and the agreement reached during the interview, Applicants respectfully submit that the presently amended claims recite subject matter that is novel and non-obvious over Welch, individually or in any combination with any of the previously cited prior art. At least based on this reason, Applicants respectfully request that the outstanding rejections of Claim 17-26 and the finality of the Office Action be removed, and the claims be passed to issuance.

The disclosure has been objected to because of informalities. Applicants respectfully submit that the amendments to the specification submitted herein have corrected these informalities and respectfully request reconsideration of the objection to Applicants' disclosure.

The proposed drawing correction filed on June 12, 2003 has been disapproved because it is not in the form of a pen-and-ink sketch showing changes in red ink. Applicants respectfully submit, as discussed with the Examiner during the interview, that the replacement drawings submitted on June 12, 2003 complied with the revised amendment procedures that no longer require submission of drawing changes in red ink. Based at least on this reason, Applicants respectfully request that the Examiner reconsider the objection to the drawing corrections submitted previously.

Figure 10 was objected to because it should be designated by a legend such as "Prior Art." Applicants respectfully request that the drawing replacement submitted on June 12, 2003 has already been labeled with a prior-art legend, thus already addressing this outstanding objection. Applicants respectfully request that the objection be reconsidered by the Examiner.

The drawings are objected to because the line for item 17 of Figure 1 does not touch the substrate to be processed that rests on element 16a. Applicants respectfully submit that the drawing replacement submitted on June 12, 2003 has also addressed this objection and herein request reconsideration thereto in view of the submission of June 12, 2003.

Claims 17-24 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite because Applicants' "conductive groove" is ambiguous. Applicants respectfully submit that the amendments submitted herein to the claims have addressed this indefiniteness problem and respectfully request withdrawal of the rejection of Claims 17-24 under 35 U.S.C. § 112, second paragraph.

Claims 17-29, 22, and 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch et al. (U.S. Patent No. 6,192,827) in view of Osaka et al. (JP Patent No. 11-037315) and Maa (U.S. Patent No. 4,771,805). Claims 21 and 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch and in view of Steger et al. (U.S. Patent No. 5,788,799). Finally, Claims 20, 23, and 26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Welch and in view of Hamrah et al. (U.S. Patent No. 5,242,538).


Applicants respectfully submit that, in view of the agreement reached during the personal interview and the amendments presently submitted, the above-summarized obviousness rejections are now moot.

The proposed amendments to the claims hereinabove submitted should be entered by the Examiner because the amendments are supported by the as filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require further search.

Based at least on the foregoing reasons, Applicants believe the present application is in condition for allowance and respectfully solicit an early Notice of Allowability.

Respectfully submitted,

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C L A I M S

1. (Amended) A vacuum processing apparatus comprising:
a vacuum processing chamber having a stage mounting a

5 substrate to be processed; and

a carrier port provided on a peripheral wall of the
vacuum processing chamber, and carrying the substrate onto and
off the stage, for generating plasma in the vacuum processing
chamber and for subjecting the substrate on the stage to a

10 plasma processing, characterized by comprising:

~~----- a shutter having a heating mechanism, retreated when the -----~~
substrate is delivered onto and off the stage, and disposed to
cover a surrounding of the stage and to surround a plasma
generation region while closing the carrier port when the
15 plasma is generated in the vacuum processing chamber, to
thereby prevent the plasma from being disordered.

2. (Amended) A vacuum processing apparatus according to
claim 1, characterized in that

20 the shutter is a cylindrical member along an inner
peripheral wall of the vacuum processing chamber, the shutter
raised by a shutter driving mechanism to close the carrier
port when the plasma is generated in the vacuum processing
chamber.

25

3. (Amended) A vacuum processing apparatus according to
claim 2, characterized in that

the shutter driving mechanism is constituted of an air cylinder disposed on an atmospheric area side, and a driving shaft elevated by the air cylinder to elevate the shutter.

5 4. (Amended) A vacuum processing apparatus according to claim 1, characterized in that

the shutter is a plate member along an inner peripheral wall of the vacuum processing chamber, the shutter raised by a shutter driving mechanism to close the carrier port when the
10 plasma is generated in the vacuum processing chamber.

5. (Amended) A vacuum processing apparatus according to claim 3, characterized in that

the shutter driving mechanism is constituted of the air
15 cylinder disposed on the atmospheric area side, and the driving shaft elevated by the air cylinder and elevating the shutter.

6. (Amended) A vacuum processing apparatus according to
20 claim 1, characterized in that

a potential of the shutter is grounded.

7. A vacuum processing apparatus, comprising a vacuum processing chamber having a stage mounting a substrate to be
25 processed; and a carrier port provided on a peripheral wall of the vacuum processing chamber, and carrying the substrate onto and off the stage, for generating plasma in the vacuum

processing chamber and for subjecting the substrate on the stage to a plasma processing, characterized by comprising:

a deposit shield disposed along an inner peripheral wall of the vacuum processing chamber; and

5 a shutter disposed to be able to be elevated along the inner peripheral wall of the vacuum processing chamber, and characterized in that

each of the deposit shield and the shutter has a grounded potential, the shutter is retreated when the substrate is
10 delivered into and outside through the carrier port and ~~displaced to be abutted on the deposit shield when the plasma~~ processing is conducted, and a plasma generation region is surrounded by an even curve, thereby generating uniform plasma.

15

8. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

the shutter is raised by a shutter mechanism to be fitted into the notch portion to thereby close the carrier port when
20 the plasma is generated in the vacuum processing chamber.

9. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

the deposit shield is a cylindrical member having a notch
25 portion, along the inner peripheral wall of the vacuum processing chamber;

the shutter is a plate member along an inner surface of the deposit shield and formed to be fitted into the notch portion; and

when the plasma is generated in the vacuum processing chamber, the shutter is pushed up toward the notch portion to close a front of the carrier port and an inner surface of the shutter forms a same curve as a curve of the inner surface of the deposit shield.

10 10. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

on an end face of the shutter on the deposit shield side, the end face is formed to have a flat surface, a groove for fitting an O ring thereinto is formed on the stage side, and a groove for fitting a spiral seal made of metal thereinto is formed on an outer periphery on the groove; and

when the processing is conducted, the deposit shield and the shutter are electrically connected to each other through the spiral seal.

20 11. (Amended) A vacuum processing apparatus according to claim 7, characterized in that

on an end face of the shutter on the deposit shield side, the end face is formed to have an L-shape to be engaged with an end face of the notch portion so as to have a convex outer periphery on the end face of the shutter; and

a groove for fitting a spiral seal made of metal
thereinto is formed on the end face of the convex portion of
the shutter is formed, and when the processing is conducted, a
concave portion of the deposit shield and the convex portion
5 of the shutter are electrically connected to each other
through the spiral seal.

12. (Amended) A vacuum processing apparatus according to
claim 7, characterized in that
10 each of the deposit shield and the shutter comprises a
heating mechanism.

13. (Amended) A vacuum processing apparatus according to
claim 7, characterized in that
15 a disk-shaped evacuation plate is disposed around the
stage, and the shutter and the evacuation plate are contacted
with each other and electrically connected with each other
when the shutter is raised.

20 14. (Deleted)

15. (Added) A vacuum processing apparatus including a
vacuum processing chamber having a stage mounting a substrate
to be processed; and a carrier port for carrying the substrate
25 onto and off the stage, for generating plasma in the vacuum
processing chamber and for subjecting the substrate on the
stage to a plasma processing, characterized by comprising:

a deposit shield disposed along an inner peripheral wall of the vacuum processing chamber, and having a notch portion at a position facing the carrier port; and

5 a shutter having a shape fitted into the notch portion of the deposit shield, having an inside forming a same curve as a curve of an inner surface of the deposit shield when the shutter is fitted into the notch portion, and disposed to be able to be elevated, and characterized in that

each of the deposit shield and the shutter has a ground
10 potential, the shutter is retreated to pass through the notch portion to carry the substrate when carrying the substrate inside and outside through the carrier port, the shutter is displaced to be fitted into the notch portion of the deposit shield when the plasma processing is conducted, and a plasma
15 generation region is surrounded by the even curve, thereby producing uniform plasma.

16. (Added) A vacuum processing apparatus according to claim 15, characterized in that

20 when the plasma is generated in the vacuum processing chamber, the shutter is raised by a shutter mechanism to be fitted into the notch portion to thereby close the carrier port and an inner surface of the shutter forms the same curve as the curve of the inner surface of the deposit shield.